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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/696,631	10/29/2003	Brian T. Rosenberger	1017.P029US	5496

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EXAMINER

PIZIALI, ANDREW T

ART UNIT	PAPER NUMBER
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1771

DATE MAILED: 06/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/696,631

Applicant(s)

ROSENBERGER ET AL.

Examiner

Andrew T. Piziali

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 15-29 is/are rejected.
- 7) ☒ Claim(s) 13 and 14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/29/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 2, 9 and 21 are objected to because of the following informality: It appears that “fibers” (in line 3) should read “carbon nanotubes” (such as in claims 3, 10 and 22). Appropriate correction is requested.

Claim Rejections - 35 USC § 102/103

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-12, 17-23 and 28-29 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over USPN 6,265,466 to Glatkowski et al. (hereinafter referred to as Glatkowski).

Regarding claims 1-12, 17-23 and 28-29, Glatkowski discloses a fabric comprising a first

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layer of yarns woven to form a fabric wherein the yarns comprise at least one carbon nanotube fiber wherein the carbon nanotube fiber comprises a single-walled carbon nanotube and/or multi-walled carbon nanotube (see entire document including column 3, lines 8-24 and the paragraph bridging columns 4 and 5).

Regarding claims 2-4, 9-11 and 21-23, Glatkowski discloses that the carbon nanotube fiber may comprise insulating or semiconducting fibers (column 1, lines 26-48) and that the yarns may comprise synthetic fibers (column 3, lines 43-57).

Regarding claims 5-6, 12, 20-23 and 28-29, Glatkowski discloses that the fabric may comprise at least one additional layer of yarns woven together (column 5, lines 9-24 and lines 50-58).

Regarding claim 6, Glatkowski discloses that the additional layer of yarns may comprise carbon nanotube fibers (column 5, lines 9-24).

Regarding claim 7, Glatkowski discloses that the carbon nanotube fibers may have different electrical and mechanical properties (column 3, lines 8-24).

Regarding claims 8-12 and 17-19, Glatkowski discloses that the fabric may be used as a garment (column 5, lines 50-58).

Regarding claims 18-19 and 28-29, Glatkowski does not specifically mention Van der Waals forces or the ability to act as a barrier to objects larger than or equal to 1×10^{-9} meters, but considering that substantially identical nano size of the carbon nanotube fibers compared to the nano size of the claimed carbon nanotube fibers, it appears that the fibers of Glatkowski would inherently possess the claimed forces and would inherently possess the claimed barrier ability.

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The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977).

5. Claims 1-5, 8-12, 15-23 and 25-29 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over USPN 6,682,677 to Lobovsky et al. (hereinafter referred to as Lobovsky).

Regarding claims 1-5, 8-12, 15-23 and 25-29, Lobovsky discloses a fabric comprising a first layer of yarns woven to form a fabric wherein the yarns comprise at least one carbon nanotube fiber wherein the carbon nanotube fiber comprises a single-walled carbon nanotube and/or multi-walled carbon nanotube (see entire document including column 14, lines 1-14).

Regarding claims 2-4, 9-11 and 21-23, Lobovsky discloses that the carbon nanotube fibers may comprise conducting carbon nanotube fibers (column 15, lines 48-58).

Regarding claims 5, 12, 20-23 and 28-29, Lobovsky discloses that the fabric may comprise at least one additional layer of yarns woven together (paragraph bridging columns 14 and 15).

Regarding claims 8-12 and 17-19, Lobovsky discloses that the fabric may be used as a garment (column 14, lines 51-59).

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Regarding claims 15-16 and 26-27, Lobovsky discloses that the yarns may have a high thermal conductivity and that the additional layer may thermally insulate the first layer from the wearer (paragraph bridging columns 14 and 15 and column 15, lines 48-58).

Regarding claims 16, 25 and 27, Lobovsky discloses that a tether may be electrically coupled to the carbon nanotube fiber layer (column 14, lines 15-50).

Regarding claims 18-19 and 28-29, Lobovsky does not specifically mention Van der Waals forces or the ability to act as a barrier to objects larger than or equal to 1×10^{-9} meters, but considering that substantially identical nano size of the carbon nanotube fibers compared to the nano size of the claimed carbon nanotube fibers, it appears that the fibers of Lobovsky would inherently possess the claimed forces and would inherently possess the claimed barrier ability.

6. Claims 1-4, 8-11 and 18-19 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over USPN 6,126,888 to Goldstein.

Regarding claims 1-4, 8-11 and 18-19, Goldstein discloses a fabric comprising a first layer of yarns woven to form a fabric wherein the yarns comprise at least one carbon nanotube fiber wherein the carbon nanotube fiber comprises a single-walled carbon nanotube and/or multi-walled carbon nanotube (see entire document including column 5, lines 33-40).

Regarding claims 2-4 and 9-11, Goldstein discloses that the carbon nanotube fiber may comprise conductive fibers that transfer energy from hot gases or flames (column 5, lines 33-40).

Regarding claims 8-11 and 18-19, Goldstein does not mention using the fabric as a garment, but the claims fail to further structurally limit the fabric. Therefore, considering that the fabric of Goldstein could be used as a garment, the fabric taught by Goldstein reads on the current claims.

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Regarding claims 18-19, Goldstein does not specifically mention Van der Waals forces or the ability to act as a barrier to objects larger than or equal to 1×10^{-9} meters, but considering that substantially identical nano size of the carbon nanotube fibers compared to the nano size of the claimed carbon nanotube fibers, it appears that the fibers of Goldstein would inherently possess the claimed forces and would inherently possess the claimed barrier ability.

7. Claims 1-4, 8-11 and 18-19 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over USPN 6,299,812 to Newman et al. (hereinafter referred to as Newman).

Regarding claims 1-4, 8-11 and 18-19, Newman discloses a fabric comprising a first layer of yarns woven to form a fabric wherein the yarns comprise at least one carbon nanotube fiber wherein the carbon nanotube fiber comprises a single-walled carbon nanotube and/or multi-walled carbon nanotube (see entire document including the paragraph bridging columns 2 and 3, and column 6, lines 56-60).

Regarding claims 2-4 and 9-11, Newman discloses that the carbon nanotube fiber may comprise conductive fibers (column 1, lines 42-57) and that the yarns may comprise synthetic fibers (paragraph bridging columns 2 and 3, and column 6, lines 56-60).

Regarding claims 8-11 and 18-19, Newman does not mention using the fabric as a garment, but the claims fail to further structurally limit the fabric. Therefore, considering that the fabric of Newman could be used as a garment, the fabric taught by Newman reads on the current claims.

Regarding claims 18-19, Newman does not specifically mention Van der Waals forces or the ability to act as a barrier to objects larger than or equal to 1×10^{-9} meters, but considering

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that substantially identical nano size of the carbon nanotube fibers compared to the nano size of the claimed carbon nanotube fibers, it appears that the fibers of Newman would inherently possess the claimed forces and would inherently possess the claimed barrier ability.

Claim Rejections - 35 USC § 103

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,682,677 to Lobovsky as applied to claims 1-5, 8-12, 15-23 and 25-29 above, and further in view of USPN 6,265,466 to Glatkowski.

Lobovsky discloses that the fabric may comprise at least one additional layer of yarns woven together (paragraph bridging columns 14 and 15), but Lobovsky does not specifically mention an additional layer comprising carbon nanotube fibers. Glatkowski discloses that it is known in the carbon nanotube woven art to include an additional layer of yarns comprising carbon nanotube fibers to produce articles such as personnel protection clothing (column 5, lines 9-24 and lines 50-58). It would have been obvious to one having ordinary skill in the art at the time the invention was made to add an suitable additional layer to the carbon nanotube fiber fabric, such as an additional layer comprising carbon nanotube fibers, because it is within the general skill of a worker in the art to select a known fabric construction on the basis of its suitability.

9. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over USPN 6,682,677 to Lobovsky as applied to claims 1-5, 8-12, 15-23 and 25-29 above, and further in view of US Patent Application Publication 2002/0053801 to Herman.

Lobovsky discloses that carbon nanotubes may be conductive, but Lobovsky does not appear to teach superconductive carbon nanotubes. Herman discloses that it is known in the art

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to vary the lattice structure of a carbon nanotube to result in the desired conductivity, such as superconductivity (see entire document including [0056] to [0061])). It would have been obvious to one having ordinary skill in the art at the time the invention was made to vary the lattice structure of the carbon nanotubes to result in the desired conductivity, such as superconductivity, based on the intended application.

Regarding electromagnetic radiation, Lobovsky discloses that a tether may be electrically coupled to the carbon nanotube fiber layer (column 14, lines 15-50), which would prevent electromagnetic radiation from penetrating (see [0057] of the current specification).

Allowable Subject Matter

10. Claims 13-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach or suggest a first layer comprising superconductive carbon nanotube fibers that form a Faraday cage woven to at least one additional layer comprising insulating carbon nanotube fibers.

Conclusion

12. The following patent is cited to further show the state of the art with respect to the different lattice structures of carbon nanotubes:

USPN 6,280,677 to Jakobson

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew T. Piziali whose telephone number is (571) 272-1541.

The examiner can normally be reached on Monday-Friday (8:00-4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel Morris can be reached on (571) 272-1478. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

atp

ATP 6/8/05
ANDREW T. PIZIALI
PATENT EXAMINER